What is claimed is,

Sub a2

1. A reflective liquid crystal display(LCD) of high aperture ratio, high transmittance and wide viewing angle comprising:

a lower substrate and an upper substrate opposed with a selected distance;

a liquid crystal layer sandwiched between the lower and upper substrates and comprising a plurality of liquid crystal molecules;

a gate bus line and a data bus line formed on the lower substrate to define a pixel;

a counter electrode and a pixel electrode formed at an inner surface of the lower substrate, wherein both electrodes are formed with a selected distance and width so that most of the liquid crystal molecules in upper portions of those electrodes are sufficiently driven by forming a fringe field between said counter and pixel electrodes;

a thin film transistor provided adjacent to an intersection of the gate bus line and the data bus line and transmitting a signal of the data bus line into the pixel electrode when the gate bus line is selected;

a polarizing plate disposed at an outer surface of the upper substrate;

a reflecting plate disposed at an outer surface of the lower substrate; and

a quarter wave plate sandwiched between the quarter wave plate and the lower substrate, or between the polarizing plate an the upper substrate,

wherein both counter and pixel electrodes are made of a transparent conductor,

wherein a distance between the upper and lower substrates is greater in length than a distance between the counter and pixel electrodes.

2. The reflective LCD of claim 1, wherein the transparent conductor is ITO(indium tin oxide).

3. The reflective LCD of claim 1, further comprising a first alignment layer coated on an opposing face of the lower substrate and having a surface for aligning the liquid crystal molecules in a selected direction in the absence of electric field and having a first rubbing axis which makes a selected angle with the electric field, and a second alignment layer coated on an opposing face of the upper substrate and having a surface for aligning the liquid crystal molecules in a selected direction in the absence of electric field and having a second rubbing axis which makes a selected angle with the first rubbing axis.

4. The reflective LCD of claim 3, wherein the first and second alignment layers are given with a pretilt angle of 0 ~ 10 degrees.

5. The reflective LCD of claim 4, wherein those rubbing axes of the first and second alignment layers are disposed anti-parallel each other.

6. The reflective LCD of claim 5, wherein the polarizing axis of the polarizing plate is coincided with the second rubbing axis.

7. The reflective LCD of claim 6, wherein the liquid crystal molecules of negative dielectric anisotropy is used when the angle between the second rubbing axis and the electric field is 0~45 degrees, and the liquid crystal molecules of positive dielectric anisotropy is used when the angle between the second rubbing axis and the electric field is 45 ~ 90 degrees.

8. The reflective LCD of claim 1, wherein the product of refractive anisotropy of the liquid crystal molecules and the distance between the upper and lower substrates is 0.2 ~ 0.6 μm.

Sub C3

9. A reflective LCD of high aperture ratio, high transmittance and wide viewing angle comprising:

a lower substrate and an upper substrate opposed with a first distance;

a liquid crystal layer sandwiched between the lower and upper substrates and comprising a plurality of liquid crystal molecules;

a gate bus line and a data bus line formed on the lower substrate to define a pixel;

a counter electrode formed at each pixel of the lower substrate, transmitted with the common signal and having a plurality of branches diverged in parallel with the data bus line and at least a bar for connecting the branches, wherein the respective branches have a first width and they are spaced with a second distance;

a pixel electrode having a plurality of strips formed between the respective branches of the counter electrode, having a second width, and spaced apart by a third distance, and at least a bar for connecting the strips;

a thin film transistor provided adjacent to an intersection of the gate bus line and the data bus line and transmitting a signal of the data bus line into the pixel electrode when the gate bus line is selected;

a polarizing plate disposed at an outer surface of the upper substrate;

a reflecting plate disposed at an outer surface of the lower substrate; and

a quarter wave plate sandwiched between the quarter wave plate and the lower substrate, or between the polarizing plate an the upper substrate,

wherein both counter and pixel electrodes are made of a transparent conductor,

wherein the first distance is greater in length than a distance between the branch of the counter electrode and the strip of the pixel electrode,

wherein the first and second widths are set such that the liquid crystal molecules in upper portions of the branch

of the counter electrode and the strip of the pixel electrode are all aligned by the electric field between adjacent branches and strips.

10. The reflective LCD of claim 9, wherein the transparent conductor is ITO(indium tin oxide).

11. The reflective LCD of claim 9, wherein the second width is smaller in length than the second distance, and the first width is smaller in length than the third distance.

12. The reflective LCD of claim 11, wherein the distance between the branch of the counter electrode and the strip of the pixel electrode is in the range of 0.1 ~ 5 μm.

13. The reflective LCD of claim 11, wherein the width ratio of the second width to the first width is 0.2 ~ 5.

14. The reflective LCD of claim 13, wherein the lengths of the first width and the second width are in the range of 2 ~ 8 μm respectively.

15. The reflective LCD of claim 9, further comprising a first alignment layer coated on an opposing face of the lower substrate and having a surface for aligning the liquid crystal molecules in a selected direction in the absence of electric field and having a first rubbing axis which makes a selected angle with the electric field, and a second alignment layer coated on an opposing face of the upper substrate and having a surface for aligning the liquid crystal molecules in a selected direction in the absence of electric field and having a second rubbing axis which makes a selected angle with the first rubbing axis.

16. The reflective LCD of claim 15, wherein the first and second alignment layers are given with a pretilt angle of 0 ~ 10 degrees.

17. The reflective LCD of claim 16, wherein those rubbing axes of the first and second alignment layers are disposed anti-parallel each other.

18. The reflective LCD of claim 17, wherein the polarizing axis of the polarizing plate is coincided with the second rubbing axis.

19. The reflective LCD of claim 18, wherein the liquid crystal molecules of negative dielectric anisotropy is used when the angle between the second rubbing axis and the electric field is 0 ~ 45 degrees, and the liquid crystal molecules of positive dielectric anisotropy is used when the angle between the second rubbing axis and the electric field is 45 ~ 90 degrees.

20. The reflective LCD of claim 1, wherein the product of refractive anisotropy of the liquid crystal molecules and the first distance is 0.2 ~ 0.6 μm.

21. A reflective LCD of high aperture ratio, high transmittance and wide viewing angle comprising:

a lower substrate and an upper substrate opposed with a selected distance;

a liquid crystal layer sandwiched between the lower and upper substrates and comprising a plurality of liquid crystal molecules;

a gate bus line and a data bus line formed on the lower substrate to define a pixel;

a counter electrode formed at each pixel of the lower substrate, transmitted with a common signal and shaped of a plate;

a pixel electrode formed over the counter electrode and having a plurality of strips, wherein the strip has a selected width and spaced from each other by a selected distance;

a thin film transistor provided adjacent to an

intersection of the gate bus line and the data bus line and transmitting a signal of the data bus line into the pixel electrode when the gate bus line is selected;

a polarizing plate disposed at an outer surface of the upper substrate;

a reflecting plate disposed at an outer surface of the lower substrate; and

a quarter wave plate sandwiched between the quarter wave plate and the lower substrate, or between the polarizing plate an the upper substrate,

wherein both counter and pixel electrodes are made of a transparent conductor,

wherein a distance between the upper and lower substrates is greater in length than a distance between the counter electrode and the pixel electrode,

wherein a width of the strip of the pixel electrode and a width of the counter electrode disposed between the strips are set such that the liquid crystal molecules in upper portions of the counter electrode disposed between the strips and the strip of the pixel electrode are all aligned by the electric field between adjacent branches and strips.

22. The reflective LCD of claim 21, wherein the transparent conductor is ITO(indium tin oxide).

23. The reflective LCD of claim 21, wherein the ratio of a width of the respective strips of the pixel electrode to a distance of the strips is 0.2 ~ 5.

24. The reflective LCD of claim 23, wherein the widths of the respective strips is in the range of 1 ~ 8 μm respectively.

25. The reflective LCD of claim 23, wherein the ratio of the distance of the respective strips of the pixel electrode to the distance between the upper and lower substrates is 0.1 ~ 5.

26. The reflective LCD of claim 23, further comprising a first alignment layer coated on an opposing face of the lower substrate and having a surface for aligning the liquid crystal molecules in a selected direction in the absence of electric field and having a first rubbing axis which makes a selected angle with the electric field, and a second alignment layer coated on an opposing face of the upper substrate and having a surface for aligning the liquid crystal molecules in a selected direction in the absence of electric field and having a second rubbing axis which makes a selected angle with the first rubbing axis.

27. The reflective LCD of claim 26, wherein the first and second alignment layers are given with a pretilt angle of 0 ~ 10 degrees.

28. The reflective LCD of claim 27, wherein those rubbing axes of the first and second alignment layers are disposed anti-parallel each other.

29. The reflective LCD of claim 28, wherein the polarizing axis of the polarizing plate is coincided with the second rubbing axis.

30. The reflective LCD of claim 29, wherein the liquid crystal molecules of negative dielectric anisotropy is used when the angle between the second rubbing axis and the electric field is 0 ~ 45 degrees, and the liquid crystal molecules of positive dielectric anisotropy is used when the angle between the second rubbing axis and the electric field is 45 ~ 90 degrees.

31. The reflective LCD of claim 21, wherein the product of refractive anisotropy of the liquid crystal molecules and the first distance is 0.2 ~ 0.6 μm.